Specifications: P4 *Enhanced*

Test Time: average 1 mS per test per pin. Fastest test time per pin is 0.6msec.

Test performed: measure Voltage, Current and Resistance between any pins

Test method: selectable force voltage or current with clamp for protection.

Measurement method: 256 channel per board with 2 wire measurement technique or 128ch (4 wire)

Force Voltage Range: ±5V @±1mV step resolution. Normal drive from ±0.1V to ±5V

Force Current Range:

Current range	Sensing R values	Drive Method	Error (4 wire)
3~50mA	- 100 Ω	FI/FV	±10uA max
0.3~5mA	- 1 KΩ	FI/FV	±1uA max
30~500uA	- 10 KΩ	FI/FV	±0.5uA max
3~50uA	- 100 KΩ	FV	±0.1uA max
3~3uA	-10 MΩ	FV	±2nA max

Resistance measurement: Accuracy and Repeatability:

For 2 wire measurement, internal switch resistance is about 40 ohm max.

For std Open Short test in semiconductor industry, 2 wire measurement is used.

Panther 4 is calibrated using a Agilent meter Model: 34401A

Test channels per card: 256ch@2wire(1card) expandable to 1536ch using 6 slot backplane

Measurement technique: Force Voltage or Current using 2 wire (std) or 4 wires measurement (option).

Test Definition: Open+, Open-, Short+, Short-, VCC, Gnd, Leakage+, Leakage-, diode integrity test etc : user define test name and pass/fail limits

Standard size of the Panther IV with 1536ch: W(340)X H(280) X D(450) mm

AC power: Universal input :110/240Vac@300W

Weight: estimated 15Kg for a 6 card system

Interface to test handler via RS232 serial interface or parallel interface

Test handler Interface enabled includes: Trim & Form, BGA Strip Handler, Pick and Place test handler, Vision Inspection system.

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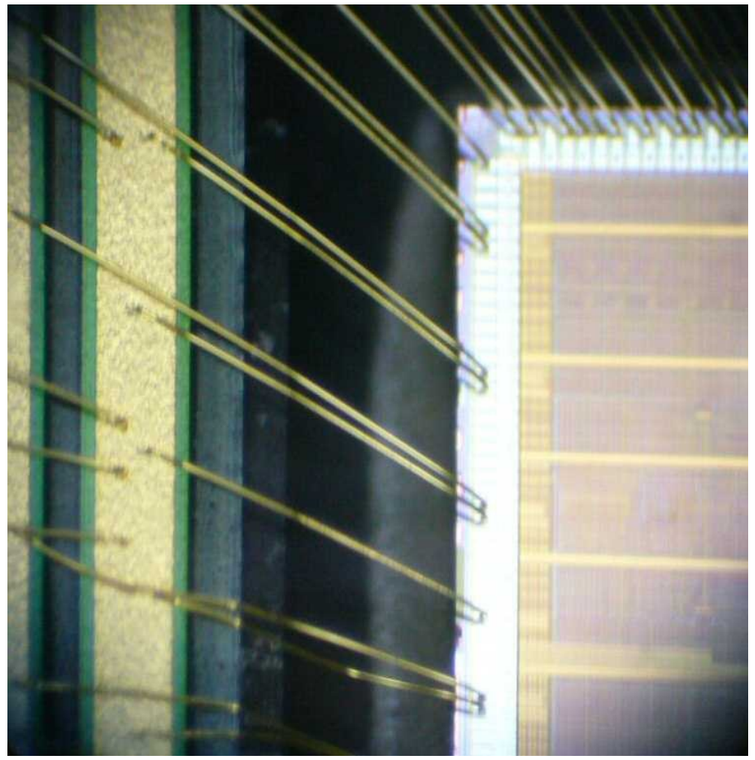
QTEST *Since 1992*

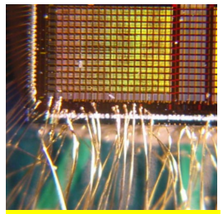
Panther IV *Enhanced*

Wire verification and OS tester for IC assembly

Special features:
1.Parallel and series test
2. Very versatile and can be interface to different handlers



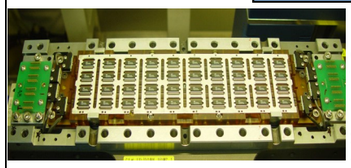
Device pin count and density are getting higher. With higher pin count, statistically you will get higher failures due to bonding. Higher pin count devices are more expensive and therefore it is important to weed out any bonding issues in assembly before shipping off to Final test.



Picture on right shows broken bonds wires

Wire verification test on wire bond can also be performed to ensure that there are no illegal open or short in the bond. The Panther IV can measure using the standard 2 wire measurement technique from 100ohm to 1Mohm. It can detect any illegal pin to pin open or short between any pins on the device. User can define different Voltage, current or resistance tests and using different limits customized to that pin detects various problems on the DUT caused by bonding or

Panther OS tester interface to Trim Form



In order to increase productivity, Assembly people in the semi-conductor industry are starting to do wire verification/OS test after Trim Form.
This helps to weed out all "process related defects" before it gets to Final Test. This fast verification/OS test is transparent to the process but help Assembly to understand its problem during the assembly process. Ultimately this help to improve its own process, increase yield and profits. Customers also like the idea because it helps to reduces its wastage due to increase yield.

Panther Interface to Strip BGA Handler

The Panther IV Wire Verification/OS tester is specially useful if you are manufacturing high pin count ICs. The possibility of a illegal Open/short problem developing in a high pin count device is higher with higher pin count.

In most companies, all testing are carried out by Test Department using very expensive Functional testers setup to do simple Open short. But this is NOT efficient and failure feedback takes too long.

Assembly need to know immediately if the bonding process was good or not. They cannot expect to wait days or weeks for Final test to tell them that their production lot was "bad" and it will too late to do anything about it.

This is why more and more assembly department are doing wire verification and OS test in Assembly. We called this TIA or Test In Assembly.

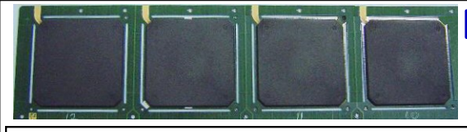
Test In Assembly does the following:
1. Helps to catch bonding and assembly problems and locate bonders or the molding machines causing low yield.
2. Save money for the company and increase production yield.

Qtest's Panther OS tester integrated to Strip BGA test handler capable of testing both TBGA and PBGA before and after mold.

Interface to different type of Production Handlers

Qtest has vast experience interfacing its OS tester to many different handlers. It can be interfaced to Pick & Place and Turret handlers for singulated devices.

Qtest has also developed handlers for strip BGA test to provide a complete solution to its customers.



Test after mold

Testing after mold allows the assembled part to be fully tested before shipping to Final Test or your customer. The molding process can also cause mechanical defects such as open or short to the bond wires. Therefore this process is a "MUST".

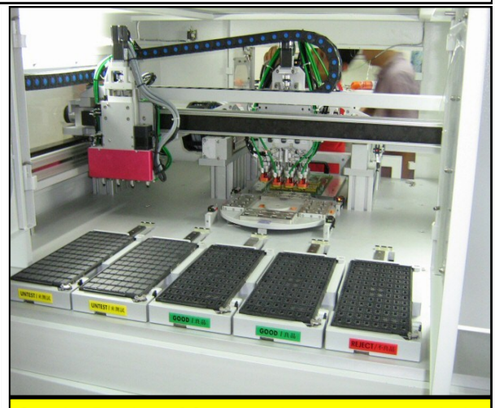
You will loose customers if you ship bad parts!!

Parallel/Series test

Panther IV can be configured to test in parallel if high throughput is needed. Each of the boards with its own microcontroller and PMU can be configured as MASTER and test chips up to 256 channels. If there is a need to test say 4 devices , each with max 256pins, you can use 4 boards to do parallel test.

The test time is the same as for one chip. In this case, it will be about 0.5 sec per chip for 256 pin device. In parallel test, the test time is also about 0.5 sec.

The boards can be configured as Master and Slave when testing high pin count device.



Qtest's Panther OS tester integrated to multisite Pick& Place handler. This complete integrated test handler system is very suitable for high mix low to medium volume production.